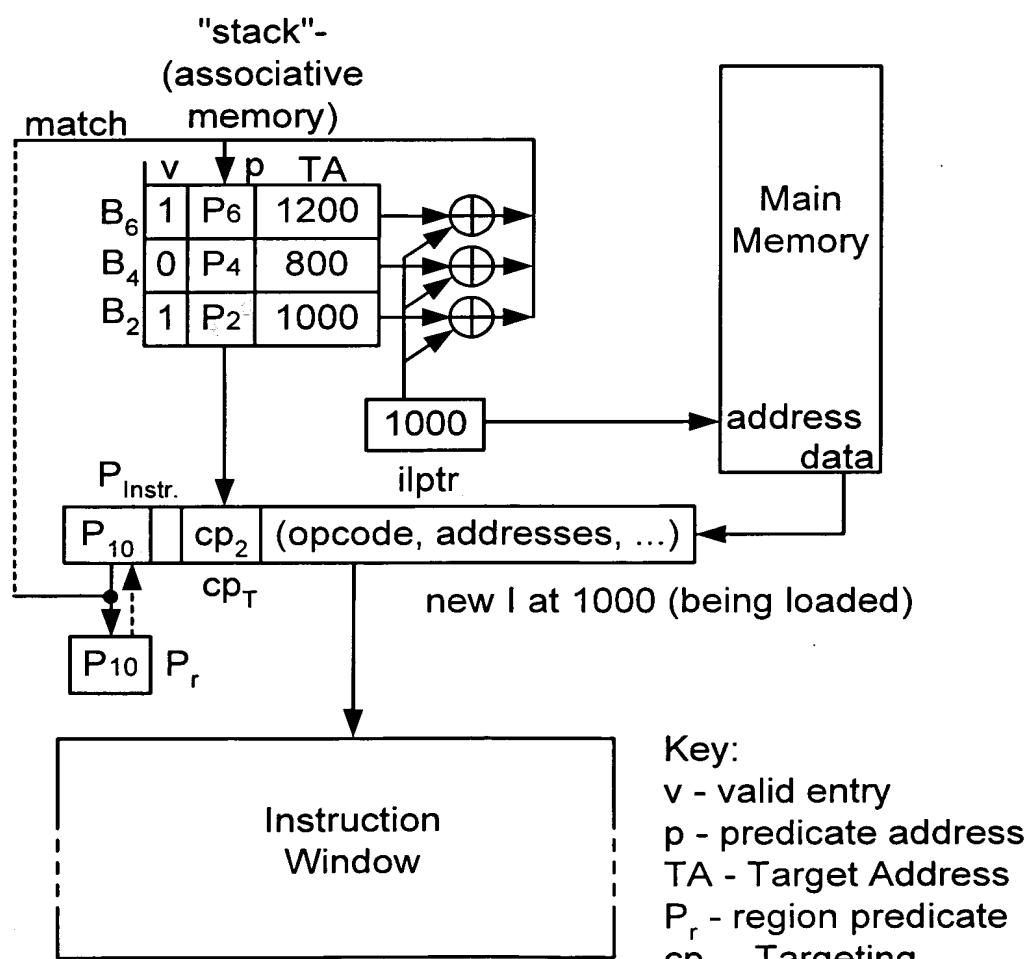
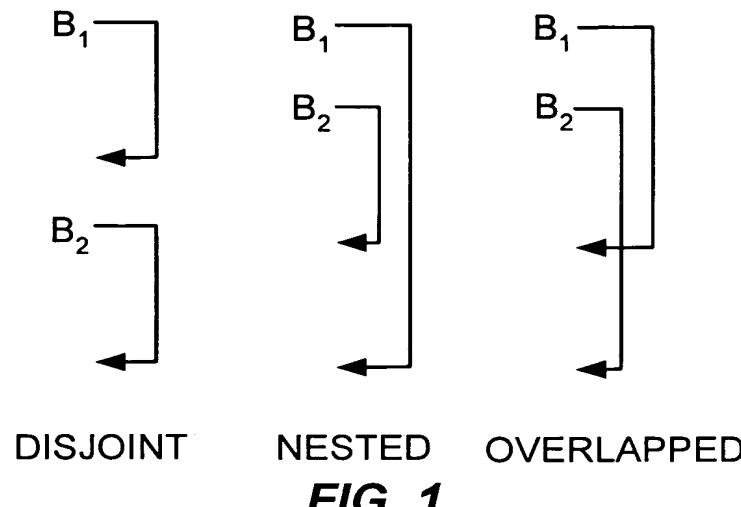


AUG 23 2004



Snapshot taken at t = 9+ of Example 5. cancelling-predicate
 -new I matches target address in stack

FIG. 2

load time	address	code	predicate-assignment (at load time)				predicate-use (at code execution time)			
			stack	<u>B</u>	<u>v</u>	<u>p</u>	<u>TA</u>	<u>p_{in}=p_r</u>	<u>cp_{in}</u>	<u>p₁ - condition for l execution</u>
1	100	l ₁					empty	1	0	p ₁ =1 - 1
2	200	B ₂	if (bc ₂) goto 400	B ₂	1	P ₂	400	1	0	p ₂ =bc ₂ bc ₂ 1
3	300	l ₃		B ₂	1	P ₂	400	P ₂	0 - -	bc ₂
4	400	l ₄	↓				empty	P ₂	cp ₂ bc ₂ +bc ₂ -	bc ₂ +bc ₂ =1
5	500	l ₅					empty	P ₄	0 - -	p ₄ =1
6	600	B ₆	if (bc ₆) goto 800	B ₆	1	P ₆	800	P ₄	0 bc ₆ ·p ₄ bc ₆ ·p ₄ 1	
7	700	l ₇		B ₆	1	P ₆	800	P ₆	0 - -	bc ₆
8	800	l ₈	↓				empty	P ₆	cp ₆ bc ₆ +bc ₆ -	bc ₆ +bc ₆ =1
9	900	l ₉					empty	P ₈	0 - -	p ₆ =1

Equations - for "T": p₁=p_{out}=p_{in}+cp_{in}; for "B": p_{out}=bc·p_{in}; cp_{out}=bc·p_{in}

FIG. 3

load time	address	code	predicate-assignment (at load time)			predicate-use (at code execution time)		
			stack	$p_{in} = p_r$	cp_{in}	p_{out}	cp_{out}	p_l - condition for l execution
1	100	l_1	$z = x \text{ op } y$	$B \begin{bmatrix} v \\ \\ p \\ \\ \text{empty} \end{bmatrix} TA$	1	0	$p_1 = 1$	-
2	200	$B_2 \begin{bmatrix} \text{if } (bc_2) \text{ goto } 800 \end{bmatrix}$	$B_2 \begin{bmatrix} 1 \\ \\ P_2 \\ \\ 800 \end{bmatrix}$	1	0	$p_2 = \overline{bc_2}$	bc_2	1
3	300	l_3	$B_2 \begin{bmatrix} 1 \\ \\ P_2 \\ \\ 800 \end{bmatrix}$	P_2	0	-	-	$\overline{bc_2}$
4	400	$B_4 \begin{bmatrix} \text{if } (bc_4) \text{ goto } 600 \end{bmatrix}$	$B_4 \begin{bmatrix} 1 \\ \\ P_4 \\ \\ 600 \end{bmatrix}$ $B_2 \begin{bmatrix} 1 \\ \\ P_2 \\ \\ 800 \end{bmatrix}$	P_2	0	$\overline{bc_4} + p_2$	$bc_4 \cdot p_2$	1
5	500	l_5	$B_4 \begin{bmatrix} 1 \\ \\ P_4 \\ \\ 600 \end{bmatrix}$ $B_2 \begin{bmatrix} 1 \\ \\ P_2 \\ \\ 800 \end{bmatrix}$	P_4	0	-	-	$\overline{bc_2} \cdot \overline{bc_4}$
6	600	l_6	$B_2 \begin{bmatrix} 1 \\ \\ P_2 \\ \\ 800 \end{bmatrix}$	P_4	cp_4	$p_6 \cdot cp_4$	$\overline{bc_4} \cdot \overline{bc_2} + bc_4 \cdot \overline{bc_2} = \overline{bc_2}$	
7	700	l_7	$B_2 \begin{bmatrix} 1 \\ \\ P_2 \\ \\ 800 \end{bmatrix}$	P_6	0	-	-	$\overline{bc_2}$
8	800	l_8	$\begin{bmatrix} \text{empty} \end{bmatrix}$	P_6	cp_2	$p_6 + cp_2$	$\overline{bc_2} + bc_2 = 1$	
9	900	l_9	$\begin{bmatrix} \text{empty} \end{bmatrix}$	P_8	0	-	-	1

Equations - for "T": $p_1 = p_{out} = p_{in} + cp_{in}$; for "B": $p_{out} = \overline{bc} \cdot p_{in}$; $cp_{out} = bc \cdot p_{in}$

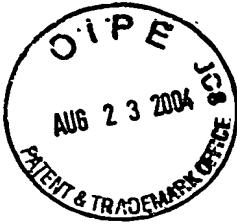
FIG. 4



load time	address	code	predicate-assignment (at load time)			predicate-use (at code execution time)		
			stack	$P_{in} = P_r \cdot CP_{in}$	P_{out}	CP_{out}	$P_l - \text{condition for } l \text{ execution}$	
1	100	l_1	$B \boxed{v_1 \ p \ TA}$ empty	1	0	$P_l = 1$	-	1
2	200	$B_2 \boxed{-}$	$B_2 \boxed{1 \ P_2 \ 600}$	1	0	$P_2 = \overline{bc_2}$	bc_2	1
3	300	l_3	$B_2 \boxed{1 \ P_2 \ 600}$	P_2	0	-	-	$\overline{bc_2}$
4	400	$B_4 \boxed{-}$	$B_4 \boxed{1 \ P_4 \ 800}$ $B_2 \boxed{1 \ P_2 \ 600}$	P_2	0	$\overline{bc_4} + P_2$	$bc_4 \cdot P_2$	1
5	500	l_5	$B_4 \boxed{1 \ P_4 \ 800}$ $B_2 \boxed{1 \ P_2 \ 600}$	P_4	0	-	-	$\overline{bc_4} \cdot \overline{bc_2}$
6	600	l_6	$B_4 \boxed{1 \ P_4 \ 800}$ $B_2 \boxed{0 \ P_2 \ 600}$	P_4	CP_2	$P_4 \cdot CP_2$	-	$(\overline{bc_4} \cdot \overline{bc_2}) + bc_2 = \overline{bc_4} + bc_2$
7	700	l_7	$B_4 \boxed{1 \ P_4 \ 800}$ $B_2 \boxed{0 \ P_2 \ 600}$	P_6	0	-	-	$\overline{bc_4} + bc_2$
8	800	l_8	empty	P_6	CP_4	$P_6 + CP_4$	-	$\overline{bc_4} + bc_2 + (bc_4 \cdot \overline{bc_2}) = 1$
9	900	l_9	empty	P_8	0	-	-	1

Equations - for "T": $P_1 = P_{out} = P_{in} + CP_{in}$; for "B": $P_{out} = \overline{bc} \cdot P_{in}$; $CP_{out} = bc \cdot P_{in}$

F/G. 5



load time	address	code	z = x op y	predicate-assignment (at load time)				predicate-use (at code execution time)			
				stack				$p_{in} = p_r$	cp_{in}	p_{out}	cp_{out}
				B	v	p	TA				
1	100	I_1					empty	1	0	$p_1 = 1$	-
2	200	B_2	if (bc_4) goto 800	B_2	1	P_2	1000	1	0	$p_2 = \overline{bc}_2$	bc_2
3	300	I_3		B_2	1	P_2	1000	P_2	0	-	\overline{bc}_2
4	400	B_4	if (bc_4) goto 800	B_4	1	P_4	800	P_2	0	$\overline{bc}_4 + p_2$	$bc_4 \cdot p_2$
				B_2	1	P_2	1000				
5	500	I_5		B_4	1	P_4	800	P_4	0	-	$\overline{bc}_4 \cdot \overline{bc}_2$
				B_2	1	P_2	1000				
6	600	B_6	if (bc_6) goto 1200	B_6	1	P_6	1200	P_4	0	$\overline{bc}_6 \cdot p_4$	$bc_6 \cdot p_4$
				B_4	1	P_4	800				
				B_2	1	P_2	1000				
7	700	I_7		B_6	1	P_6	1200	P_6	0	-	$\overline{bc}_6 \cdot \overline{bc}_4 \cdot \overline{bc}_2$
				B_4	1	P_4	800				
				B_2	1	P_2	1000				
8	800	I_8		B_6	1	P_6	1200	P_6	cp_4	$p_6 + cp_4$	$(\overline{bc}_6 \cdot \overline{bc}_4 \cdot \overline{bc}_2) + (bc_4 \cdot \overline{bc}_2)$ $= (bc_6 + bc_4) \overline{bc}_2$
				B_4	0	P_4	800				
				B_2	1	P_2	1000				
9	900	I_9		B_6	1	P_6	1200	P_8	0	-	$(\overline{bc}_6 + bc_4) \overline{bc}_2$
				B_4	0	P_4	800				
				B_2	1	P_2	1000				
10	1000	I_{10}		B_6	1	P_6	1200	P_8	cp_2	$p_8 + cp_2$	$((\overline{bc}_6 + bc_4) \overline{bc}_2) + bc_2$ $= bc_6 + bc_4 + bc_2$
11	1100	I_{11}		B_6	1	P_6	1200	P_{10}	0	-	$(\overline{bc}_6 + bc_4) bc_2$
12	1200	I_{12}			empty				P_{10}	cp_6	$p_{10} + cp_6$
13	1300	I_{13}				empty				P_{12}	0
											1

Equations - for "T": $p_1 = p_{out} = p_{in} + cp_{in}$; for "B": $p_{out} = \overline{bc} \cdot p_{in}$; $cp_{out} = bc \cdot p_{in}$